

REMARKS

Claims 1, 12, 20 and 22 are amended. New claims 23-39 are added. Claims 1-39 are currently pending in the application.

The amendments to claims 1, 12, 20 and 22 are supported by the application as filed and do not present new matter.

New claims 23-39 are supported by the application as filed and do not present new matter. See, e.g., p. 2, lines 2-14; p. 6, lines 4-5; p. 6, lines 13-17; p. 6, lines 15-17; p. 6, lines 22-24; Fig. 1; p. 8, lines 15-17; p. 12, lines 13-18.

Reconsideration of the application, as amended, is respectfully requested.

I. Claims 1-9, 11-19, 21 and 22 Are Patentable Over Akella and Netravali

Independent claims 1, 12 and 22 and respective dependent claims 2-9, 11, 13-19 and 21 are rejected under 35 U.S.C. § 103 as being unpatentable over Akella *et al.*'s Synthesizing Converters Between Finite State Protocols ("Akella") in view of U.S. Patent No. 5,680,522 to Netravali *et al.* ("Netravali").

Applicants note that the Office action rejects dependent claim 21 based on two references - Akella and Netravali. Claim 21 depends from independent claim 20. Independent claim 20 is rejected based on Akella and Netravali and, in addition, based on Al-Karmi and Mano. Clarification from the Examiner is respectfully requested.

Applicants respectfully traverse the rejections. In order to expedite prosecution of the application, Applicants submit the above amendments to claims 1, 12, 20 and 22 and the following remarks.

A. Akella Does Not Disclose Or Suggest "Automatically" Limitations

Applicants acknowledge that the Office action agrees with Applicants that "Akella does not explicitly disclose automatically synthesizing the interface..." (1/26/05 Office Action, pg. 3, para. 2; pg. 5, para. 2; pg. 8, para. 1).

Thus, in accordance with the Examiner's acknowledgement, Akella does not disclose or suggest "automatically synthesizing an interface between the structurally different first and

second signaling protocols of the first and second electronic circuit blocks based on the first and second finite automata” as recited in independent claims 1 and 12.

Further, Akella does not disclose or suggest “automatically generating a third representation of one or more permitted operations of said first and second finite automata” as recited in claim 20. (Office Action, p. 3, para. 2; p. 8, para. 1).

Moreover, Akella does not disclose or suggest “automatically generating a representation of one or more permitted operations of the first and second finite automata” as recited in claim 22. (Office Action, pg. 3 and 6 (last sentence)).

Rather, as discussed in page 4, line 20 - p. 5, line 9 of the subject application, Akella explains that an interface is manually created by a designer who specifies the interface behavior (Akella, p. 411, col. 2, para. 1). Akella, therefore, is clearly deficient relative to amended independent claims 1, 12, 20 and 22.

B. Akella Does Not Disclose Or Suggest And Teaches Away From “Without Manually Entering” Limitations

Akella fails to disclose or suggest automatically synthesizing an interface between the structurally different first and second signaling protocols of the first and second electronic circuit blocks based on the first and second finite automata, “without manually entering the interface behavior” as recited in independent claims 1 and 12 and “without manually entering the third representation behavior” as recited in claim 20.

In contrast, as discussed above, the Examiner acknowledges that Akella does not disclose automatically synthesizing the interface. (Office action, p. 3). Instead, Akella explains that an interface is created by a designer who specifies the desired sequence inter-operation and that “no general theory for synthesizing protocol conversions exists,” (Akella, p. 410, col. 1, paras. 1 and 2; p. 411, col. 2, para. 1). Akella, therefore, is clearly deficient relative to independent claims 1, 12 and 20.

Further, Akella teaches away from Applicants’ claims considering that Akella refers to “desired sequence” and “specified” with regard to the inter-operation between the interfaces. (Akella, p. 411, col. 2, para. 1).

C. Netravali Does Not Disclose Or Suggest Exchanging Data Messages Between First And Second Electronic Circuit Building Blocks Having Different Signaling Protocols

Claims 1, 12, 20 and 22 have been amended to further define the invention in the context of electronic circuit building blocks and different signaling protocols of electronic circuit building blocks. The subject application explains that there is pressure on manufacturers to reuse complex building blocks (also known as Intellectual Property, or IP). Most IP is available at the register transfer level (RTL). Embodiments of the invention address issues concerning a variety of signaling conventions that are used for interfacing between IP blocks (See, e.g., p. 1, line 25 - p. 2, line 19).

Further, it is known that electronic circuit building blocks or “semiconductor IP” are portions of or building blocks of a chip or circuit, e.g., for use in electronic design automation (EDA). The electronic circuit building blocks are reusable blocks or “cores” that may be made available commercially to others as portions of new designs. In other words, an IP or electronic circuit building block is a reusable block of a design or testbench or model of the system environment used during verification of a design to provide simulation inputs and respond to simulated outputs. (See, e.g., (p. 1, lines 12-23; EDA Consortium, EDA Glossary (http://www.edac.org/industry_glossary.jsp#I)).

Netravali does not disclose or suggest a method for exchanging data messages between a first electronic circuit building block having a first signaling protocol for exchanging messages and a second electronic circuit building block having a second signaling protocol for exchanging messages as recited in claim 1 and the related first electronic circuit building block, second electronic circuit building block, first signaling protocol and second signaling protocol limitations of 12, 20 and 22.

Netravali does not even refer to an “electronic circuit building block,” an “intellectual property” or “IP” block. In contrast, Netravali describes a gateway between computer networks. This is illustrated in Figure 1 of Netravali. (See also col. 1, lines 6-7; col. 29-32; claim 1) (referring to computer networks and gateway system between computer networks). This is further demonstrated by Netravali describing network communication protocols, such as SNA, DECNET and OSI, and that “differences in network layer functionalities, bit rates, buffering,

interfaces and hand-off procedures” and that “automatic generation of systems to overcome the architectural mismatches is not foreseeable in the near future.” (Netravali, col. 1, lines 13-30-36) (emphasis added).

Thus, Netravali does not relate to electronic circuit or IP building blocks having different signaling protocols, as is also demonstrated by Akella. Akella explains:

In the past, heterogeneous computer networks were used, but each computer was itself homogenous in that all its subsystems followed the same protocol. But the proliferation of specialized applications such as input/output and networking has resulted in the need to integrate various types of subsystems within the computer system [1]. These subsystems may not have been originally designed to work with one another. Therefore their integration constitutes a heterogeneous computer system where even small mismatches in protocols will prevent proper operation of the system [5].... There have been several successful specific protocol conversions. In such cases, the inter-process communication devices (IPCDs) such as bus adapters, gateways, and bridges convert one communication protocol to another so that transactions begun on one bus can end on another...” (Akella, col. 1, para. 2) (emphasis added).

Thus, Akella acknowledges, and differentiates, gateways and integration of different subsystems, such as IP blocks, within a computer system. Netravali, therefore, is deficient relative to amended independent claims 1, 12, 20 and 22, and Akella further supports this conclusion.

Correspondingly, even if Akella and Netravali were combined, the combination would neither disclose nor suggest Applicants’ claims. Therefore, Applicants submit that claims 1, 12, 20 and 22 are patentable over Akella and Netravali.

Moreover, there is no suggestion or motivation to combine Akella and Netravali in view of Netravali relating to networking and network protocols, and Akella differentiating gateways and noting the differences between communications between homogeneous computer systems and heterogeneous computer systems having subsystems that follow different protocols.

D. Dependent Claims 2-9, 11, 13-19 and 21 Are Allowable

Dependent claims 2-9, 11, 13-19 and 21 incorporate the elements and limitations of respective independent claims 1, 12 and 20 and add novel and nonobvious limitations thereto. Accordingly, these dependent claims are allowable over the cited references.

Further, claim 2 recites “automatically corresponding data from said structurally different first and second protocols,” which is not disclosed by Akella and Netravali, either alone or in

combination. Furthermore, claim 3 recites “automatically translating data between said first protocol to said second protocol, said data in said first protocol having a first sequence, said data in said second protocol having a second sequence that is different from said first sequence,” which is not disclosed by Akella and Netravali, either alone or in combination.

Further, claim 21 recites “automatically generating a third representation, representing one or more permitted operations of said first and second finite automata” which is not disclosed or suggested by the cited references, particularly in view of the amendments to claim 20.

E. Dependent Claim 10 and Independent Claim 20 Are Allowable

Dependent claim 10 and independent claim 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Akella in view of Netravali and further in view of U.S. Patent No. 5,862,251 to Al-Karmi et al. (Al-Karmi) and Mano’s Computer Science Architecture (“Mano”).

The deficiencies of Akella and Netravali relative to independent claim 20 are discussed above. Accordingly, the arguments are not repeated. Nevertheless, Applicants note that the Al-Karmi and Mano patents do not cure the deficiencies of Akella and Netravali relative to claim 20, as discussed above.

Claim 10 incorporates the elements and limitations of independent claim 1 and adds novel and nonobvious limitations thereto. Accordingly, claim 10 is also allowable.

Consequently, even if Akella, Netravali, Mano and Al-Karmi were combined, the combination would neither disclose nor suggest all of the elements and limitations of claims 10 and 20 and claims 10 and 20 are allowable. Nevertheless, Applicants submit the following remarks to further demonstrate patentability of these claims.

With regard to claim 10, the Examiner states that “Claims 1 and 8’s arguments apply identifying the non-deterministic transition and determine a transition state for each input are fundamental practices in FSM’s construction.” Applicants respectfully submit that the invalid / useless operations of Akella are not non-deterministic transitions for each interface state as recited in claim 10. The non-deterministic transitions for the interface state mean that the state has more than one transition. In fact, the invalid/useless operations of Akella are deterministic, because there is no question that they cannot be used. Therefore, Akella does not disclose “identifying non-deterministic transitions for each interface state” as recited in claim 10.

Regarding claim 20, Applicants respectfully submit that the “product machine is taken and pruned of the invalid/useless states” does not disclose “automatically eliminating non-determinisms” as recited in claim 20. An invalid state is not a non-deterministic state. A non-deterministic state occurs when two or more operations may be used. A deterministic state occurs when only one operation can be used. In fact, an invalid/useless state is deterministic, because it is not used. Therefore, Akella does not disclose “automatically eliminating non-determinisms in said third representation” as recited in claim 20.

Turning to Al-Karmi, Al-Karmi teaches “constructing a new deterministic finite state machine from an NFA” (Col. 5, lines 8 - 9) not “automatically eliminating non-determinisms in said third representation” as described in claim 20.

In addition to the multiple deficiencies discussed above, Applicants also respectfully submit that there is no suggestion or motivation to combine Al-Karmi with any of the Akella, Netravali and Mano references. Al-Karmi relates to optical character recognition of scanned cursive, handwritten text. (Al-Karmi, Abstract; col. 1, lines 8-10; claim 1). On the other hand, Akella, Netravali and Mano are unrelated to recognizing handwriting. While Applicants recognize that “analogous” art must be used to reject the claims under MPEP §2141.01(a), Applicants respectfully submit that the instant rejection goes too far and does not satisfy the requirement that “the reference must either be in the field of applicant’s endeavor or, if not, then be reasonably pertinent to the particular problem with which the invention was concerned.”

In the instant case, Al-Karmi relates to recognizing cursive handwriting, whereas Applicants’ claims relate to exchanging data messages between electronic circuit building blocks having different signaling protocols. Thus, the first element of “analogous” art is not satisfied.

In addition to the first element, the Examiner must also show that Al-Karmi is reasonably pertinent to the particular problem with which the invention was concerned. The invention is concerned with exchanging data messages between electronic circuit building blocks having different signaling protocols. Al-Karmi, in contrast, is concerned with recognizing cursive, handwritten text by means of a state machine. (Al-Karmi, claim 1; col. 5, lines 1-5). That Al-Karmi describes using a state machine in connection with recognizing cursive hand writing does not entitle the examiner to rely on the reference, particularly considering that state machines are

well known. Accordingly, the Office action assertions extend beyond that which is allowed under MPEP §2141.01(a).

Dependent claim 10 and independent claim 20 are, therefore, allowable.

II. New Claims 23-39 Are Patentable Over Akella, Netravali, Al-Karmi and Mano

New dependent claims 23-39 incorporate the elements and limitations of respective independent claims 1, 12, 20 and 22 and add novel and nonobvious limitations thereto. Accordingly, these dependent claims are allowable over the cited references.

New dependent claims 27-30 recite electronic circuit building blocks being reusable at a system level.

New dependent claims 31-33 recite aspects of automatically synthesizing an interface or a third representation of one or more permitted operations when data sequencing between the first and second signaling protocols is different.

New dependent claims 34-36 recite aspects of an interface or third representation automatically labeling data referenced by the first and second signaling protocols.

New dependent claims 37-39 recite aspects of an interface or third representation being automatically synthesized between the first and second electronic circuit building blocks within a computer.

III. Conclusion

Based on the forgoing amendments and remarks, the Applicants respectfully submit that the application is in condition for allowance and respectfully request that a timely Notice of Allowance be issued in this case. If there are any remaining issues that can be resolved by telephone, Applicants invite the Examiner to contact the undersigned at the number indicated below.

Respectfully submitted,

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